Examining the Relationship between Resilience, Time, and Posttraumatic Growth (PTG) in an Irish Sample

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Abstract

Background: The advent of positive psychology movement formed a pathway toward salutogenic approach in the treatment of common mental health disorders. Posttraumatic growth [PTG] refers to positive and transformative psychological changes that occurs as a result of deliberate effort of coping with adverse life experiences.

Objective: The present study aimed to examine the relationship between resilience, time, and PTG in a non-clinical, Irish sample.

Methods: This study adopted a quantitative, cross-sectional design. Applying a non-probability convenience sampling technique, participants (N=103) were recruited online, completing a shared Google questionnaire including demographic information, the Connor-Davidson Resilience Scale (CD-RISC), and the Posttraumatic Growth Inventory (PTGI).

Results: Hierarchical multiple regression analysis supported the notion that time since traumatic event and resilience predicted a significant amount of variance in posttraumatic growth in a non-clinical, Irish sample.

Conclusion: Individuals exposed to traumatic experiences exhibit PTG over time, and resilience showed a stable trajectory in our sample. Promoting resilience contributes to a supporting framework, that optimizes public health and advance positive mental health to a greater societal level. More longitudinal studies are needed to evaluate and determine the direction between resilience and posttraumatic growth with a greater emphasis on the timing factor. Practical implications discussed.

Keywords: resilience, elapsed time, posttraumatic growth, mental health, Ireland

Table of Contents

Introduction

This project will examine the relationship between resilience, time, and posttraumatic growth (PTG) in a non-clinical, Irish sample. The literature review will begin in providing a general overview of trauma and its prevalence before introducing the phenomena of posttraumatic growth and describing recent empirical findings on this research area. Research on negative consequences following traumatic experiences garnered a hallmark attention towards concerns facing potential mental disorders, such as, anxiety (Kou et al., 2021), depression (Guo et al., 2017; Li et al., 2021; Ran et al., 2020; Wu et al., 2015), and posttraumatic stress disorder (PTSD), a well-acknowledged mental disorder associated with exposure to traumatic experiences (Dickinson, 2020; Jeon et al., 2017; Lee et al., 2020; Liang et al., 2019; Mehta, et al., 2020). Undeniably, traumatic experiences can produce various negative consequences, encompassing adverse psychological functioning (Liu et al., 2020; Sharp et al., 2018), and debilitating pathological impact on the individual's overall mental health (Dursun & Sölylemez, 2020; Jeon et al., 2017; Lee et al., 2020; Mangelsdorf & Luhmann, 2019; Tedeschi et al., 2018), coupled with increasing demand on the healthcare systems (Hayes et al., 2017; McNicholas, 2018; McNicolas et al., 2020), to the extent of economic- (Department of Health, 2020; Leys et al., 2020), and global burden (Patel et al., 2016; Trautman, Rehm, & Whittchen, 2016). In European context, psychiatric syndromes, such as depression, along with anxiety speak for 6% of all health illnesses (Han & Nestler, 2027; NIMH: depression and anxiety disorders, 2012). The cost of mental health on the Irish economy is estimated at €11 billion every year (Department of Health, 2020), which should raise significant concerns and is deserving of being of the focus of attention with such a high impact on society and on the economy.

Trauma, prevalence, and impact

The latest edition of (DSM-5, American Psychiatric Association [APA], 2013) defines trauma as an aversive event, that involves witnessing actual or threatened death (Tedeschi & Moore, 2020), moreover, it refers to the individuals' emotional reaction to a potential threat (Jeon et al., 2017). The high prevalence of exposure to potential traumatic events [PTEs] respectively, over 50% (Koenen et al., 2017; Lukaschek et al., 2013), up to 90% (Kessler, 2017; Kilpatrick et al., 2013) through our lifetime indicates that, trauma is universal and inevitable fact of life (Benjet et al., 2016; Mehta et al., 2020). However, compared to the high prevalence of trauma exposure, only between 1.3% and 12.2% of those exposed to trauma develop PTSD, depending on the type, density, and circumstances of trauma (Dickinson, 2020; Karam et al., 2014; Koenen et al., 2017). In fact, empirical evidence shows that, largely, individuals tend to exhibit resilience in the face of adversity (Bonnano & Diminich, 2013; Bryant, et al., 2015; Shalev et al., 2017), furthermore, a growing body of scientific literature reveals a distinguished prevalence of potential posttraumatic growth (Tedeschi & Moore, 2020; Tamiolaki & Kalaitzaki, 2020) in the wake of trauma. In essence, the prevalence of self-reported PTG is significantly higher, ranging from 30% (Maitlis, 2020) up to 83% (Dickinson, 2020; Malhotra & Chebiyyam, 2016; Marziliano et al., 2020). The following section will introduce the phenomenon posttraumatic growth (PTG) to the reader.

Posttraumatic Growth (PTG)

"*That which does not kill me makes me stronger" – Friedrich Nietzsche, 1888.*

Growing through suffering is not a new paradigm, it is a concept of ancient philosophy (Malhotra & Chebiyyam, 2016; Tedeschi, 2020). The emergence of the positive psychology movement (Dursun & Sölylemez, 2020; Kou et al., 2021) brought a philosophical shift departing from the ideology of ill health (Maddux & Lopez, 2015) and the pathogenic legacy of medical model (Infurna & Jayawickreme, 2019; Joseph, 2019) to a salutogenic

approach (Boehm-Tabib & Gelkopf, 2020; Jeon et al., 2017; Norton, 2019; Shakespeare-Finch & Lurie-Beck, 2014; Swords & Houston, 2020). Posttraumatic growth is a phenomenon, that stems from the positive psychology movement (Dickinson, 2020; Dursun & Sölylemez, 2020; Rzeszutek et al., 2020) and refers to the positive and transformative psychological changes that occur as a result of struggle coping with adverse life events (Tedeschi & Calhoun, 1996; 2004; Tedeschi et al., 2018; Tedeschi & Moore, 2020). In the course of developing a measuring mechanism for PTG, the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996; 2004), factor analyses revealed five domains of self-reported growth: greater appreciation of life, increased sense of personal growth, new possibilities, deeper and meaningful relationships, and spiritual growth. The authors, Tedeschi & Calhoun (2004) emphasized that, the traumatic event itself does not promote growth, but the struggle with the new reality is a crucial component in the development of PTG. Therefore, growth is the consequence of endeavor coping mechanism with struggle, resulting from deliberate efforts attributable to the individuals' response (Henson, et al., 2020; Olson et al., 2020; Tedeschi, & Moore, 2020), and attempts to grasp the fundamental meaning (Henson et al., 2020) of adverse life experiences and challenging circumstances (Tedeschi et al, 2015; Tedeschi et al., 2018). In this regard, traumatic experiences can serve as a catalyst and fertile ground towards self-maturation (Liu et al., 2020), in the development of positive experiences and psychological attributes (Blackie, et al., 2017; Brooks et al., 2020; Joseph, 2019). In addition, adversity potentially stimulates personal growth (Calhoun & Tedeschi, 2013; Henson et al., 2020; Maitlis, 2019; Olson et al., 2020). Then, in the context of PTG, trauma is being regarded as a circumstance, through which, the individual possesses a unique opportunity to advance positive and transformative psychological changes, as opposed to the DSM classification, whereby, trauma is merely being referred to as the experience of an adverse event (APA, 2013; Tedeschi & Moore, 2020). Thus, from the

lens of positive psychology, PTG can be classified as the process of positive trauma response (Blackie et al., 2017, Dickinson, 2020).

Current state-of-the art on PTG Research

Available literature on PTG have been examined in the context of victims and survivors of certain type of traumatic events. For instance, PTG literature on psycho-oncology research area garnered considerable attention and has been extensively studied on cancer population (Casellas-Grau et al., 2017; Cordova et al., 2017; Hauken et al., 2019; Henson et al.., 2020; Kou et al., 2021; Li et al., 2020; Mangelsforf & Luhmann, 2019; Park & Park, 2016; Rzeszutek et al., 2020; Tanyi et al., 2020), specifically, with survivors of breast cancer (Boyle et al., 2017; Fujimoto & Okamura, 2021; Kusvanto et al., 2020; Ramos et al., 2018). This clinical sample scored higher than average on PTGI (Wang et al., 2014) with younger survivors also scoring higher levels of growth compared to their older counterparts (Boyle et al., 2017; Casellas-Grau et al., 2017; Sharp et al., 2018; Wu et al., 2019). A prospective study carried out in Ireland by Sharp et al. (2018) echoed this trend in a sample of head and neck cancer (HNC) survivors, ranging between 28-92 years of age, however, utilizing target population sampling technique, the obtained 59% response rate mainly represented younger survivors' data. Under other conditions, a recent study by Walsh (2020), using a mixed-method approach design among a sample of 67 Irish female cancer survivors, also supported this notion, where no significant association between age and growth was reported.

While there is a tendency for women to score higher on PTGI (Achterhof et al., 2017; Maltais et al., 2020; Nakayama et al., 2017; Sharp et al., 2018), some researchers asserted inverse findings. For instance, Mordeno et al. (2016), found no gender differences on PTGI scoring among Asian/Filipino adults, considering a representable sample size of (N=895) one month post a natural flood disaster. Likewise, a recent study by Ewert and Tessneer (2019) assessing resilience and growth utilizing experiential education (EE), among young adults ranging

between 19-24 years of age, these authors suggested that gender was not a significant predictor of PTG, however, the small sample size was emphasized in their exploratory analysis.

Positive association between higher levels of education and perceived growth have been reported among patients with acquired brain injury (Grace et al., 2015) and cancer survivor patients five years post treatment (Cormio et al., 2017). In this regard, among a sample of women earthquake survivors Zhou et al. (2020) posited lower level of education to be positively linked to lower levels of PTG. Further, Maltais et al. (2020) articulated lower level of education being inversely associated with higher levels of growth among victims of train derailment over a three-year period of post-disaster. Indeed, these findings are valuable and important for comparison purposes composing inferences with results from non-clinical sample.

The current PTG literature on time passed since the traumatic experience present inconsistencies. For example, a study conducted by Bianchini et al. (2017) in Italy, assessing the relationship between anxiety and depressive symptoms and PTG encompassed by survivors of the natural disaster of 2009 L'Aquila Earthquake, researchers concluded no age or gender differences. An absence of growth and moderate presence of anxiety and depression, over a two-year post-disaster assessment was reported. In line with this, Mordeno et al. (2016) surmised that individuals who show acute stress symptoms within a month following adversity, are more likely to develop psychiatric syndromes. Their findings, however, indicated a prevalence of moderate to high levels of growth within a month following disaster. In line with this, in a longitudinal study Carra & Curtin (2017) reported positive, transformative effects of PTG among Australian farming population soon after a flooding natural disaster. Other researchers (Hirooka et al., 2017; Wang, 2016) reported positive and stable effects of growth 6-month after trauma. Furthermore, the longer time passed since the traumatic event has been shown to be positively linked to higher levels of PTGI scores (Liu et al., 2017). Longitudinal

study with adolescents and young adults also recorded higher positive scores at 12 months post trauma, compared to 6 or 24 months (Husson et al., 2017). Although, both resilience, and PTG are salutogenic constructs (Anderson, 2018; Ewert & Tessneer, 2019), nonetheless, the available literature reveals mixed findings on their relationship. For example, Infurna and Luthar (2018) posited that individuals exposed to traumatic events are not deemed to show resilient trajectory. In line with this notion, negative correlation between resilience and PTG has been further observed in a longitudinal study by Garrido-Hernansaiz et al.'s (2017) among 119 HIV positive, Spanish patients, eight-months post diagnosis. On the contrary, compelling empirical literature affirms negative correlation between resilience and major health disorders, such as, depression, (Han & Nestler, 2017; Jones-Bitton, 2020; Osofsky et al, 2011), anxiety (Fossion et al., 2013; Osofsky et al., 2011; Ran et al., 2020), and traumatic stress (Zanatta et al., 2020). Moreover, in a sample of Syrian refugees, resilience was positively associated with PTG, and higher levels of PTGI scores were reported in those, diagnosed with PTSD (Cengiz et al., 2019). Additionally, Rzeszutek et al.'s (2017) 1-year longitudinal study in a Polish sample of HIV positive patients posited that, high levels of resilience were positively correlated with higher levels of PTGI scoring at a 1-year follow up.

The current study

Despite major interest in the field of PTG research area, characteristics linked with PTG is limited to target population sampling frame, assessing individuals characterized by specific event or type of trauma. To our knowledge (which is relative), the current literature lacks from research comprising of non-clinical sample. Our assumption is being endorsed by Mangelsdorf and Luhmann's (2019) claim, postulating that more than 50% of PTG related longitudinal studies are being conducted on clinical samples. Likewise, Kou et al.'s (2021) recent summary on PTG research trend from 1996 to 2020, reported that more than half of top 10 cited articles are being carried out on oncology research, and primarily on survivors of breast cancer.

Along these lines, the following practical implications were proposed: firstly, since a non-clinical sample would not have the confounding effects of the illness (e.g., biological factors, brain changes, or medication), it would allow clinical practitioners, mental health professionals to acquire initial assessment and characteristics that prevail across the population. Thus, this knowledge would be beneficial in implementing an approach promoting improved mental health services to the public. For this reason, research would greatly benefit from obtaining and examining data from a non-clinical sample. Secondly, scientific literature (Achterhof et al., 2017; Cengiz et al., 2019; Dursun et al., 2016; Henson et al., 2020; Shubert et al., 2016) posits high prevalence levels of PTG in those, clinically diagnosed with PTSD. Fundamentally, this research and further studies might provide an insight into the various factors that could shift PTSD into positive growth and encourage the development of PTG. This crucial knowledge would be essential in how support services might change their approach in accommodating and contribute to service users' advancement in the progress of growth. Thirdly, empirical research further claims that 75% mental health disorders that continue into adulthood develop before age 25 (Kessler et al., 2007). Examining an Irish sample, therefore, would be particularly useful, since Ireland has the youngest population in Europe, with one third of the population under 25 years of age (Central Statistics Office [CSO] 2016). In the face of an unprecedented increase of 26% in referrals (Department of Health, 2020) to Irish Child and Adolescent Mental Health Services [CAMHS] from 2012 to 2017, youth mental health remains neglected (McNicholas et al., 2020; Murphy, 2017) and underserved (Kelly, 2019; Tatlow-Golden & McElvaney, 2015). Lastly, understanding the relationship between resilience and PTG in non-clinical, Irish sample would serve valuable practical benefits, optimizing public health framework that contributes to positive mental health at a greater macro societal context. In this manner, accepting Maltais et al.'s (2020) recent solicitation, articulating the need for more research in clarifying the relationship between resilience and growth, our study intended to

address this invitation.

Resonating the abovementioned research gap, the present study aimed to determine whether elapsed time and resilience would predict the advancement of PTG in a non-clinical, Irish sample. Built upon existing empirical literature, this research anticipated to control for confounding variables (gender, age, and years of education), those of formerly demonstrated compelling variance in predicting growth. Accordingly, the following research question were addressed: If we control for gender, age, years of education, does elapsed time and resilience predict a significant amount of variance in posttraumatic growth? Pertinent to feasible empirical literature, our hypothesis posited that, controlling for socio-demographic variables, elapsed time and resilience will add predictive utility to a model of PTG.

Methods

Participants

The total number of 103 consisted of 41 males (39,8%) and 62 females (60.2%). The obtained sample size is in line with guidelines for minimum sample size requirements for regression analysis. Applying Tabachnic & Fidell' s (2013) formula: (N>50+8m), n=number of participants, m=number of predictor variables, a minimum sample size of n= 90 was recommended. Participants ranged between 18 and 57 years of age, with average age of 34.62 (SD=9.50). The study utilized a non-probability, convenience sampling method, using an online google survey to recruit and collect data from eligible participants. The initial sample size consisted of 114 participants, but 11 responses were excluded from statistical analyses, since those responses did not meet the adequate criteria for the time elapsed question, resulting a final sample of n=103.

Design

The study adopted a quantitative approach and observational cross-sectional research design. To test our hypothesis, Pearson's correlation was conducted to examine the relationship between the criterion variables and the predictor variable. A hierarchical multiple regression analysis was administered to determine whether elapsed time and resilience added a significant amount of variance in PTG controlling for gender, age, and years of education. Gender, age, years of education, elapsed time and resilience were those of predictor variables (PVs). The criterion variable (CV) was posttraumatic growth.

Measures

Utilizing an online google survey, participants were asked to provide with the following demographic information: gender, age, and years of education. Further, participants were asked to self-report time since the adverse event up to 3 years, using a weekly unit format.

Posttraumatic Growth Inventory (PTGI)

The Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) remains one of the most reliable and valid sources for assessing and evaluating personal growth (Jayawickreme et al., 2018; Joseph 2019; Olson et al., 2020). Moreover, this scale has foreseen as an appropriate model representing the long-term outcomes of individuals exposed to traumatic experiences (Mordeno et al., 2015), for this reason, it has been translated and used in multiple languages, and adopted across different cultures (Dursun and Söylemez 2020; Lenz et al., 2020). On the 21-item factor-analyzed scale, PTGI measures the following five domains of reported growth: relating to others, new possibilities, personal strength, spiritual change, greater appreciation of life. To evaluate the self-reported growth, participants rate on a 6-point Likert scale, where 0 implies "I did not experience this change" to 5: "I did experience this change to a very great degree". Summation of possible scores 0-105 indicates the level of PTG (see Appendix D), where a score equal or higher than 57 suggests the occurrence of growth (Bianchini et al., 2017). Posttraumatic Growth Inventory demonstrates a good reliability and validity over time, with reported Cronbach's alpha of 0.90 and 0.71 test-retest reliability among college students (Tedeschi & Calhoun, 1996), further, a Cronbach alpha coefficient of 0.79 was recently reported among breast cancer survivors by Fujimoto et al. (2021). For the current sample, the Cronbach alpha was (α=.95), indicating a high level of internal consistency.

Connor-Davidson Resilience Scale (CD-RISC)

The Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) assess resilience using a self-administered, 25-item factor-analyzed scale. The CD-RISC obtains a 5-component structure: personal competence, ability to deal with stress, ability to bounce back in the face of adversity, control, and spiritual affect. On a 5-point Likert scale, participants rate from 0: "Not true at all" to 4: "True nearly all the time" and CD-RISC scoring then evaluated by adding up all items. Scoring ranges between 0-100, higher scores indicate higher levels of

resilience (please see Appendix E). The CD-RISC exhibit high levels of reliability and validity over time (Windle et al., 2011). Previous study suggested that Cronbach alpha levels between .80 and .91 indicates good to excellent internal consistency (Smith et al., 2008). Using CD-RISC in a sample of adult accident survivor and victims of crime, Lee et al. (2020) reported a Cronbach alpha of .94). Likewise, the Cronbach alpha for CD-RISC was (α=.94), affirming high level of internal consistency in our sample.

Procedure

An online questionnaire expedited the data collection. The survey was shared through social media platforms and anonymity was preserved. Participants learnt about the study and involvement through the informed consent process, where confidentiality, voluntary participation and right of withdrawal from the research at any time were addressed, but once participant submitted the questionnaire, there was no opportunity for withdrawal. This was clearly articulated before commencing the online questionnaire (see Appendix A). Informed consent was obtained on the basis that participants read and understood the involvement of taking part in the research project and voluntarily collaborated with their study engagement (see Appendix B). Participation in the current study involved no more than 10 minutes. Upon establishment of consent, eligible participants gained access to the online questionnaire. First, demographic information was obtained, asking gender, age, and total years of education. In this section, participants were also asked to provide with information referring to time passed since the aversive event happened in a weekly format (see Appendix C). Next, the Posttraumatic Growth Inventory (PTGI), followed by the Connor-Davidson Resilience Scale (CD-RISC) were presented to the participants (for full details please see Appendices D, E). Following study completion, debriefing information was provided (see Appendix F) with relevant avenues and contact details for support. Further, participants had the opportunity to ask questions throughout the research participation. For communication channel, the relevant

contact information (name, affiliation, and college e-mail address of the researcher and academic supervisor) was provided in both, Study Information Sheet and Debriefing Sheet. After data collection the following confidentiality and data protection arrangements were administered: the collected data was entered into a password protected (encrypted) data. Next, the dataset was standardized employing analytic/numeric coding, the computed data then from Microsoft Excel database was imported to the Statistical Package for Social Sciences (IBM SPSS) software (Pallant, 2020) for statistical analyses, using the latest (27) version.

Ethical considerations

In conjunction with the National College of Ireland (NCI) Ethical Guidelines and Procedures for Research involving Human Participants; the Psychological Society of Ireland (PSI) Code of Professional Ethics (PSI, 2010); and Belmont Report (Department of Health, 2014), ethical approval for the study was obtained from the National College of Ireland Psychology Program Team. Albeit, this study postured a very minimal risk(s) to the participants, during all stages of the research project ethical considerations were adequately identified, considered, and addressed. This objective was facilitated by the informed consent process and the debriefing procedure.

Results

Descriptive statistics

The total sample of 103 participants consisted of 41 males (39.8%) and 62 women (60.2%). The mean age of the participants was 34.62 (SD=9.50), ranging between 18-57 years. The mean PGTI score in our Irish sample was 72.90 [95%CI 68.68, 77.13], ranging from 17-105, and 69.90% of the total participants scored in the prevalence of moderate to high PTG (a score that equal or above 57). Descriptive statistics for continuous variables are presented in Table 1.

Table 1

Descriptive statistics for all continuous variables, N = 103

Variable	*M* [95% CI]	SD	Range
Age	34.62 [32.76, 36.48]	9.50	18-57
Education	16.26 [15.54, 16.99]	3.70	9-30
Elapsed time	67.65 [57.23, 78.07]	53.30	1-156
Resilience	76.75 [73.67, 79.83]	15.77	16-100
Posttraumatic growth	72.90 [68.68, 77.13]	21.62	17-105

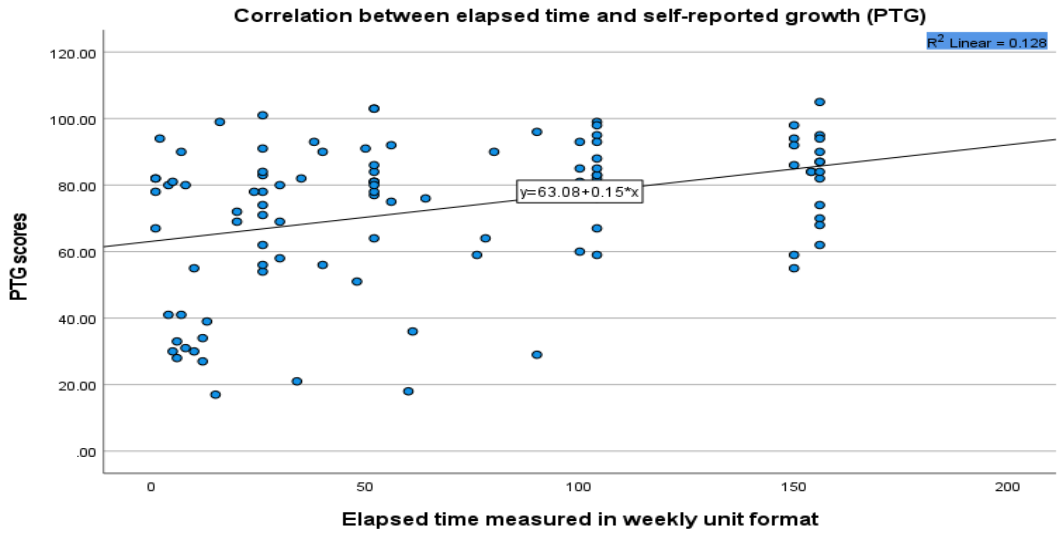
Inferential statistics

Hierarchical multiple regression was performed to assess the ability of elapsed time, and resilience to predict levels of posttraumatic growth, after controlling for gender, age, and years of education. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The correlations between the predictor variables and the criterion variable included in the study were examined and presented in Table 2. Two of predictor variables, namely Elapsed time, that was measured in weekly unit format (r= .36, p<0.001), and Resilience (r=.31, p=0.001) were significantly

correlated with the criterion variable. For illustrative purposes, please see Graph 1 and Graph 2 below. All correlations were weak to moderate, ranging between r= .01 to .36. Tests for multicollinearity also indicated that all Tolerance and VIF values were in an acceptable range. These results indicate that multicollinearity was unlikely to be a problem (Tabachnick & Fidell, 2007), and the data was suitable for multiple linear regression analysis.

Graph 1

Correlation between elapsed time and PTG, N=103



Graph 2

Correlation between resilience and PTG, N=103

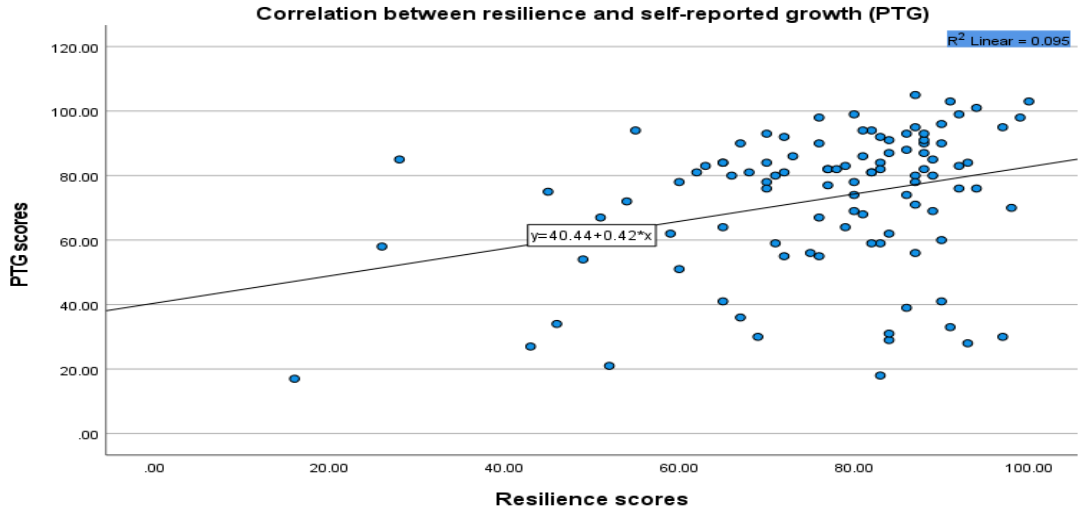


Table 2

Pearson's correlations between the model variables, N=103

Variable	1.	2.	3.	4.	5.	6.
1. Posttraumatic growth	1					
2. Gender	.14	1				
3. Age	-.10	.02	1			
4. Years of education	-.07	-.08	-.01	1		
5. Elapsed time	.36***	.10	.04	.11	1	
6. Resilience	.31***	-.08	.03	.11	.12	1

Note: Statistical significance: *p<.05; **p<.01; ***p<.001

In the first step of hierarchical multiple regression, gender, age, and years of education were entered. This model was not statistically significant F (3, 99) = 1,08; *p*=.361 and explained 3,2% of the variance in posttraumatic growth scores. After the entry of elapsed time and resilience at step 2, the total variance explained by the model was 24.6% (F (5, 97) = 6.32; *p*<0.001). The introduction of elapsed time and resilience explained an additional 21.4% variance in posttraumatic growth scores, after controlling for gender, age, and years of education; a change that was statistically significant (R^2 Change = .214; F (2, 97) = 13.77; p<0.001). In the final model, two of the five predictor variables were found to uniquely predict posttraumatic growth to a significant degree. Elapsed time measured in weekly unit format was a positive predictor of posttraumatic growth, and it was the strongest predictor in the model (β = .33, p<0.001). Resilience was a positive predictor of posttraumatic growth (β= .30, p=0.001). See table 3 for full details.

Table 3

Hierarchical regression model predicting levels of posttraumatic growth, N=103

Variable	R^2	Adj.R^2	B	SE	β	t	p
Step 1	3.2%						
Gender			5.84	4.36	.13	1.34	.183
Age			-.23	.23	-.10	-1.01	.315
Education			-.34	.58	-.06	-.59	.559
Step 2	24.6%***	21.4%***					
Gender			5.23	3.92	.12	1.33	.186
Age			-.28	.20	-.12	-1.38	.170
Education			-.75	.52	-.13	-1.43	.157
Elapsed time			.13	.04	.33	3.67	.000
Resilience			.41	.12	.30	3.30	.001

Note: R^2 = R-squared; Adj R^2 = Adjusted R-squared; B = unstandardized beta value; SE = Standard errors of B; β = standardized beta value; N = 103; Statistical significance: *p<.05; **p<.01; ***p<.001.

Discussion

This study sought to examine the relationship between resilience, time, and posttraumatic growth in an Irish sample. Elapsed time and Resilience were statistically significant predictors at the .05 level; therefore, our hypothesis was supported. The mean age in our Irish sample was 34.62. Despite the wide dispersion of age distribution (18-57) in our study, age showed no predictive value. This is in contrast with majority of psycho-oncology research on PTG, including Sharp's et al.'s (2018) study among Irish head and neck cancer (HNC) survivors, which suggested that being younger was significantly correlated with higher levels of growth. However, the reported average PTGI score in their study was 55.74 [95%CI 53.15, 58.33], a significantly lower score compared to our non-clinical sample, participants displaying an average PTGI score of 72.90 [95%CI 68.68, 77.13]. This pattern in our results could be explained by the absence of the confounding effects of the illness, i.e., medication, multi-modal treatment (chemotherapy), that prevail in clinical samples. Thus, our findings are consistent with Walsh's (2020) recent study, which asserted that age showed no predictive value on PTG levels. These findings are also consistent with Bianchini et al.'s (2017) study, which likewise concluded that age was not a predictive value in their PTG model. Taken together with our findings, there is now more evidence that suggest individuals derived from non-clinical sample develop PTG, and age is independent of growth across lifespan.

In our sample (N=213), gender neither, did not yield significant results in predicting growth. This is in line with findings from Mordeno's et al.'s (2016) study, which reported no gender differences on PTGI scores. The results indicate no cross-cultural differences between the Filipino and the Irish individuals in terms of examining gender on self-reported growth. This is of particular interest, since some researchers in PTG literature (Hofstede et al., 2010; Triandis, 2001) acclaimed cross-cultural differences between collectivist (ie., Asian) to individualist (i.e., western countries) cultures. Our results then, are consistent with Ewert and

Tessneer's (2019) exploratory analysis, and our findings supported their hypothesis, which indicated no gender differences on self-reported growth.

The average educational attainment in our Irish sample was 16.26, ranging between 9-30 years of educational engagement, exemplify the fact that Ireland possesses one of the most educated workforces in the world (Department of Housing, Local Government and Heritage, 2020). However, in our sample, years of education showed no predictive value of education on PTG.

The mean resilience score in our Irish sample was 76.75 [95%CI 73.67, 79.83] ranging from 16-100 out of the total 100. In our final model, resilience was a positive predictor of posttraumatic growth (β= .30, p=0.001). These results were in contrast with Infurna and Luthar's (2018) review, that concludes resilience is a common pathway following challenging life experiences. These results were also in contrast with Garrido-Hernansaiz et al.'s (2017) longitudinal study, that suggest lower levels of resilience to be negatively correlated with PTG. These findings then, are consistent with previous literature (Cengiz et al., 2019), that suggest higher levels of resilience is positively correlated with higher levels of reported growth. These findings then, also support Rzeszutek et al.'s (2017) assumption, that suggest positive correlation between resilience and PTG. Taken together, the findings add to the existing empirical PTG literature that supports the notion that resilience has a predictive value on PTG.

For the current study, time passed since trauma was measured in weekly unit format. Accordingly, the average time since trauma experienced in our Irish sample was 67.65 [95%CI 57.23, 78.07], 1.28 years or 15 months, respectively. In our hierarchical multiple regression model, time since trauma was the strongest predictor (β = .33, p<0.001) of PTG. Our results contradict Bianchini et al.'s (2017) findings, which suggested that PTG is not a commonly acquired trajectory following adversity. In our non-clinical, Irish sample, 69.90% of the total participants (N=103) reported moderate to high prevalence of PTG (equal or above 57). Our

results are in line with Liu et al.'s (2017) study, that suggested positive correlation between time since trauma and levels of PTG. Our results are also in line with Carra and Curtin's (2017) longitudinal study, which indicated that positive effects of PTG can occur promptly after adversity. These findings are also supported by Maltais et al.'s (2017) conclusion, which suggested greater general- and mental health status three years after adversity. This linear relationship in our sample was illustrated in a scatterplot format in Graph 1. Taken together, these findings serve as supporting evidence to the broader PTG literature and also supports the authors of PTG (Tedeschi & Calhoun, 2004), theory, revealing that PTG is a universal phenomenon and is relatively stable over time.

Practical implications

Acknowledging the high prevalence of PTG in a non-clinical, Irish sample is therefore, a reason for hope. A focus on the provision of factors, circumstances, and development of skills necessary for PTG might be an effective way to treat individuals with PTSD in a more holistic way resulting in a positive outcome of a traumatic experience. This is supported by Seligman's (1998) proposal on the mission of psychology practice, calling highly competitive psychologists to encourage the recovery process, advancing psychological preparedness (Janoff-Bulman, 2004), that contributes to the individuals' positive mental health. Moreover, augmenting the findings in several health contexts, including, raising awareness of PTG phenomenon in the patient's family and social network. Thus, the abovementioned practical implications indicate a beneficial future in PTG research home and abroad.

Mental Health Ireland

Findings of the current study are in line with Ireland's National Mental Health Policy, A Vision for Change [AVFC] (Department of Health, 2020), through which a focus of attention that is being fixated on positive mental health framework. Stigma over mental health have been long established and know as a factor that further generates stable and debilitating effects

(Kelly, 2006), and divides social classes (Crump et al., 2013). In the last decade Ireland has put forward compelling measures in attempt to address this. In 2015, on the review of Mental Health Act 2001 (Expert Group on Review of the Mental Health Act 2001) the expert group recommended the removal of the term *mental disorder*, along with no further definition to be provided for terms *severe dementia* or *significant intellectual disability*. As a substitute, the expert group recommended the re-definition of the formal term, mental illness to *changeable condition*. Likewise, from the positive aspect of mental health terminology, the term *mental fitness* has been recently introduced to the Irish Mental Health literature (Breslin et al., 2018; Robinson et al., 2016) with an aspiration of de-stigmatizing improvement, advancing the concept that, mental health is restorable. These are initial measures, however, they bear powerful quality, because drawing conclusions from the past, where psychiatric jargon dominated the field along with the pathogenic legacy of medical model (Joseph, 2019; Stuhlmiller & Dunning, 2000), likewise, the use of positive terminology may as well generate long-term positive mental health outcomes.

Strengths and limitations

To our knowledge, this is the first study that examined the relationship between resilience, time, and posttraumatic growth in an Irish sample. The novelty of our study is the fact that our sample represented non-clinical population, utilizing non-bias sample frame, making possible to draw reliable conclusions when comparing with clinical sample data is a strength that merits credit. Further, our sample size provided with confidence in reporting generalizable findings, that prevail across the general population.

Despite the abovementioned valuable strengths, indeed, our study is not free of limitations. Given the nature of cross-sectional design and self-reported scales, no cause-effect relationship can be inferred. For instance, posttraumatic growth has been shown to foster psychological resilience and improved mental health following adversity (Dursun and

Söylemez; 2020; Olson et al., 2020). Consequently, psychologically prepared individuals, therefore, may respond to future trauma demonstrating resilient trajectory. This was beyond our scope; however, our study design could not capture such undertaking.

Conclusion and further research directions

Herein, an attempt has been made to examine the prevalence of PTG in non-clinical sample. Our study concludes that individuals exposed to adverse life experiences have a great potential outperforming their previous status quo. Our Irish sample exemplified that majority of individuals in this population possess resilient trajectory. This notion is in line with Ireland's National Recovery Framework (Health Service Executive, [HSE], 2017), suggests a promising path for those effected by trauma and diagnosed with common mental illnesses in the act of departing from victimhood perspective towards an altered philosophy of life through the employing of the trauma-informed approach and service delivery

The fact that PTG literature did not reach a peak, over three decades, since the 1990's, indicates a great academic interest in this field or research (Kou et al., 2021). Likewise, in Ireland, PTG research is still at infancy level. A possible explanation may stem from the lack of satisfactory network between social care, public-care, and mental health services (Kelly, 2019). Further research should implement a biopsychosocial model approach to capture additional factors that may promote or impede the development of PTG. Further, based on our findings, more longitudinal studies needed to determine the direction between resilience and PTG. Likewise, further research should investigate the effect of current social trends (i.e., social media usage) on PTG.

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Appendix A
Study Information Sheet

Study Information

You are being invited to participate in a research study. Please take the time and read this document carefully before deciding whether to take part in the study. The aim of this information leaflet is to clearly explain the purpose of the research and what it would involve from you upon participation. If you have any questions about the study and information provided, please do not hesitate to contact me using the details provided at the end of this sheet.

Information about the current study

I am a final year undergraduate student in the BA Psychology programme at National College of Ireland. As part of my degree, I must carry out an independent research project. My final year project aims to examine age, gender, elapsed time, resilience, and posttraumatic growth. The project will be supervised by Dr. David Mothersill, Lecturer at National College of Ireland.

What involves taking part in the study

Taking part in the current study will involve giving informed consent and meeting the outlined inclusion and exclusion criteria in the next section. First, you will be asked to fill out a very short demographic information, followed by completion of an online questionnaire about Posttraumatic Growth (21 questions) and Resilience Scale (25 questions). Finally, you will be debriefed and provided with contact details of resources and helplines in the case of distress that may arise from taking part in the study. The estimated time involved to take part in the study will not take more than 10 minutes.

Voluntary participation

You are not obligated to take part in this study. Your participation in this research is

completely voluntary, and you will take part of your own free will, with no reward for participating. However, if you decide to take part, please consider that, given the nature of anonymous data collection for this study, individual responses cannot be identified, therefore, once you submit your questionnaire, withdrawal from the study will be no longer possible.

Possible risks and benefits of taking part

There are no direct benefits for you taking part in this research. However, data collected will contribute to research that helps us understand more about posttraumatic growth. Some of the questions contained within the survey may cause minor distress for some participants. If you experience any of this, you are free to discontinue participation and exit the questionnaire at any stage of the research process. Contact details with relevant helplines and resources will be provided following the questionnaire in the debriefing sheet.

Confidentiality, data storage and protection

All data collected for this study will be treated in the strictest confidence. The questionnaire is anonymous, so if you participate in this study, your data will be stored in a de-identified manner. This means no personal or potentially identifiable information will be recorded.

All data collected for this study will be stored securely in a password protected/encrypted file on the researcher's computer. Only the researcher and the academic supervisor will have access to the data.

Data collected and generated from the study will not be archived and/or stored for secondary data analysis. In accordance with NCI data retention policy, data will be retained for 5 years and destroyed afterwards.

Results of the study

All information collected for this study will be used for the purpose of my thesis and results will be presented in my final dissertation, which will be submitted to National College of Ireland. Significant findings may also be presented at conferences as well submitted to an

academic journal for publication.

Participation

You can participate in this study if you are between 18 and 60 years of age, you understand English language and experienced adverse life events in the last 3 years. The exclusion criteria for this study: you cannot take part in the study if you do not meet the abovementioned criteria, or taking part of vulnerable groups (e.g., children; the very elderly; individuals with intellectual and/or learning disabilities, who cannot understand the purpose of the research and/or the consent process).

Permission and Ethical Approval

Permission for the research and Ethical Approval for the proposed study has been approved by the National College of Ireland Psychology Program Team.

Contact for further information

I would like to thank you for your interest, devoted time, and participation in this study.

If you have any further questions or need any clarification or further information on anything abovementioned, please do not hesitate to contact myself or my academic supervisor using the following contact information:

Researcher – Lidia Bocotan, posttraumaticgrowthFYP@gmail.com

Supervisor – Dr. David Mothersill, david.mothersill@ncirl.ie

Appendix B
Consent Form

Project Summary: Aversive life experiences are certainly challenging, but they can also foster many positive outcomes. Posttraumatic growth is a very fascinating area of psychology research and yet, still has a lot to offer to individuals and society by endorsing a shifting paradigm and awareness of how challenging life circumstances, even trauma may stimulate favourable and permanent growth. This study aims to examine resilience, time and posttraumatic growth.

Ethical Approval: This research project has been approved by the National College of Ireland Psychology Program Team.

By clicking below, you are agreeing to the following:

1) You have read and understood the above Study Information Sheet on PTG.
2) You had opportunity to ask questions about the study and you received satisfactory answers from the researcher to all your questions.
3) You are aware of any potential risks that you may encounter by taking part in this study also, fully aware that you are free to withdraw from the study at any stage without any given reason or consequences.
4) You agreed to take part in this research voluntarily (without coercion).

I am 18 or older*

◯ Yes

I experienced adverse life events in the last 3 years*

◯ Yes

◯ No

I consent to take part in the study*

◯ Yes

◯ No

Appendix C
Demographics

Below are some basic questions on your demographic information. Please note that no personal information is required to be given. Generic information like this can be helpful as it

Age*

_____

Gender*

◯ Male

◯ Female

◯ Other

Years of education* - All up, how many years of education have you completed? (Please include all primary and secondary schooling, and studies you've undertaken after high school).

_____

Please indicate the elapsed time* since adverse event happened in a WEEKLY unit format up to three years time, e.g., 1 month=4 weeks; 1 year=52 weeks; 2 years=104 weeks, 3 years=156 weeks).

Appendix D
Post Traumatic Growth Inventory (PTGI)

Posttraumatic Growth Inventory is a 21-item scale, that measures the following five domains of growth: relation to others, new possibilities, personal strength, spiritual change, appreciation of life. Please indicate for each of the statements the degree to which this change occurred in your life as a result of the adverse circumstances, using the following scale: 0=I did not experience this change as a result of my crisis; 1=I experienced this change to a very small degree as a result of my crisis; 2=I experienced this change to a small degree as a result of my crisis; 3=I experienced this change to a moderate degree as a result of my crisis; 4=I experienced this change to a great degree as a result of my crisis; 5=I experienced this change to a very great degree as a result of my crisis.

1. I changed my priorities about what is important in life.
2. I have a greater appreciation for the value of my own life.
3. I developed new interests.
4. I have a greater feeling of self-reliance.
5. I have a better understanding of spiritual matters.
6. I more clearly see that I can count on people in times of trouble.
7. I established a new path for my life.
8. I have a greater sense of closeness with others.
9. I am more willing to express my emotions.
10. I know better that I can handle difficulties.
11. I am able to do better things with my life.
12. I am better able to accept the way things work out.
13. I can better appreciate each day.

14. New opportunities are available which wouldn't have been otherwise.

15. I have more compassion for others.

16. I put more effort into my relationships.

17. I am more likely to try to change things which need changing.

18. I have a stronger religious faith.

19. I discovered that I'm stronger than I thought I was.

20. I learned a great deal about how wonderful people are.

21. I better accept needing others.

Appendix E

Connor Davidson Resilience Scale (CD-RISC)

Connor and Davidson Resilience Scale comprises 25 items, rated on a 5-point Likert scale. Please indicate how well or poorly these statements resembles you based on the below description of the answers: 0=not true at all; 1=rarely true; 2=sometimes true; 3=often true; 4= true nearly all of the time.

1. Able to adapt to change.
2. Close and secure relationships.
3. Sometimes fate of God can help.
4. Can deal with whatever comes.
5. Past success gives confidence to new challenges.
6. See the humorous side of things.
7. Coping with stress strengthens.
8. Tends to bounce back after illness or hardship.
9. Things happen for a reason.
10. Best effort no matter what.
11. You can achieve your goals.
12. When things look hopeless, I don’t give up.
13. Know where to turn for help.
14. Under pressure, focus and think clearly.
15. Prefer to take the lead in problem solving.
16. Not easily discouraged by failure.
17. Think of self as strong person.
18. Make unpopular or difficult decisions.
19. Can handle unpleasant feelings.

20. Have to act on a hunch.

21. Strong sense of purpose.

22. In control of your life.

23. I like challenges.

24. You work to attain your goal.

25. Pride in your achievements.

Appendix F
Debriefing Sheet

I would like to thank you for your participation in this research. You have been of great help!

What was this study about?

Positive psychological changes can be experienced because of the struggle with traumatic or highly challenging life circumstances.

This study aimed to examine gender, age, education, time passed since the adverse event and resilience on posttraumatic growth.

How was this measured?

In the first section of the online questionnaire demographic information (gender, age, total years of education and time) was obtained, followed by the 21-item Posttraumatic Growth Inventory (PTGI-21), and the 25-item Connor-Davidson Resilience Scale (CD-RISC)

Confidentiality

Please be assured that data provided will be treated at the highest confidentiality. The online questionnaire was anonymous, and data collected will be stored in a de-identified manner, meaning no personal or potential information will be recorded.

Statement concerning data storage

Collected data will be stored securely in a password protected file and only myself and my academic supervisor will have access to it. Further, according to the National College of Ireland Retention Policy, data generated from this project will be retained for 5 years and will be destroyed afterwards.

Questions

If you have any question in relation to this research, please feel free to contact us:

Researcher: Lidia Bocotan - posttraumaticgrowhtFYP@gmail.com

Academic Supervisor: Dr. David Mothersill - david.mothersill@ncirl.ie

Contact details for support

If you experienced any type of psychological distress as a result of taking part in the study, please feel free to get in contact with myself or my supervisor via e-mail addresses provided. Otherwise, you may also consult the following trauma-specialist counselling services using the provided links to get in contact for further information.

https://www.psychologytoday.com/us/treatment-rehab/trauma-and-ptsd/nh/dublin

Trauma Recovery Institute

86 Amiens St, Mountjoy, Dublin 1

Tel.: 086 664 4430

Further reading on the topic

If you are interested reading more on this topic, you may certainly find this book of great use:

Tedeschi, R. G., Shakespeare-Finch, J., Taku, K., & Calhoun, L. G. (2018). *Posttraumatic growth: Theory, research, and applications*.